



Spectra Series™ Plug-In and Feeder Busway

STORAGE PRECAUTIONS

Before storing, unpack sufficiently to make a check of the busway for possible concealed damage resulting from shipping and handling. If damage has occurred, notify the shipper immediately. If the busway is free of damage, restore packing until ready for installation.

Store indoors in a clean, dry area, preferably close to the installation points.

Protect the busway from mechanical damage and any contact with, or exposure to, corrosive fumes, liquids, salts or concrete.

Failure to store and protect the busway properly can cause serious damage and will void the warranty.

PRE-INSTALLATION PROCEDURE

When possible, deliver the busway to its installation location before unpacking. Large labels on each shipping carton or crate designate the items contained. Additionally, each busway piece is identified with an item number label.

Inspect each busway piece for possible damage or contamination. Contact surfaces must be clean. However, no attempt should be made to polish tarnished contact surfaces.

Check to make certain that joint insulators are not damaged or cracked and are firmly in place.

(Megger each piece before installation.)

INSTALLING SPECTRA SERIES™ BUSWAY

Establish bus bar phase sequence ("ø side" is labeled) to determine how the busway is to be installed so as to maintain correct phasing throughout the system.

Note that phase transposition lengths, when furnished, may relocate the ø to the opposite side of the busway run.

Each busway piece has a "bar-end" and a "joint-end", see Figure 1. Normally the busway is oriented end for end with bar-ends pointing away from the source.

In vertical risers the "bar-ends" should be up, and the ø side should be on the right when facing the plug outlet.

In vertical riser installations, it is easier to lower the busway into place than to raise it.

If installation drawings have been furnished, information regarding the orientation of the busway end for end, and location of the ø side, as well as other pertinent data will be furnished. These drawings should be carefully followed to insure a proper busway system.

When lifting the busway by fork lift or by crane, distribute and balance the weight to avoid flexing or other damage to the housing.

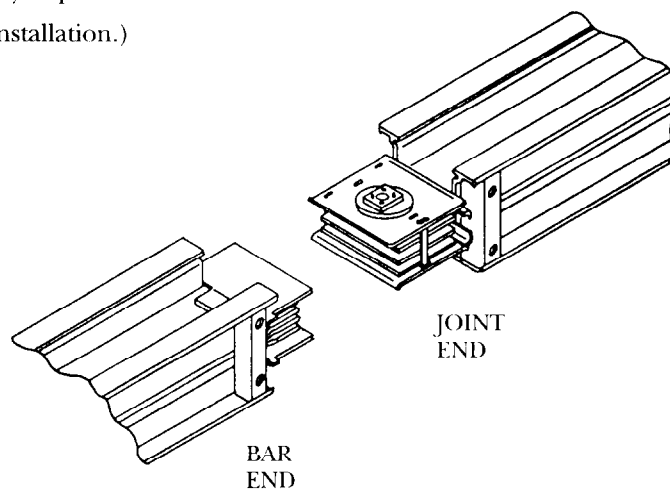


Figure 1.

Installing Spectra Series™ Busway (cont.)

WHERE TO START

Start the installation, if at all possible, at the most critical point, such as a main feed box., switchboard or switchgear, an elbow, or other critical fitting or termination.

OBSTRUCTIONS

Where a busway run must pass thru a wall or floor, an opening one-inch larger than the busway cross-section should be provided. Joints may not occur inside walls or floors per N.E.C. A flange is available to mask the opening after the busway is installed.

MINIMUM CLEARANCES

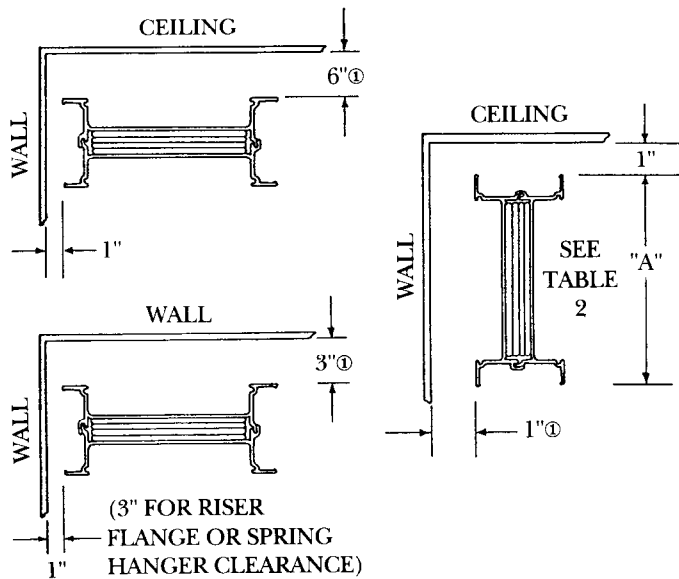


Figure 2.

① 4" minimum provides clearance for 30-100 amp fusible plugs. 7" minimum for 200 amp fusible plugs. 8" minimum for all other plugs. See Table 1.

HORIZONTAL MOUNTING

Overhead Support: 1/2" drop rods are recommended. Max 10 foot spacing. Drop rods and other hardware must be furnished by the installer.

Maintain good alignment of the drop rods along the busway run.

Avoid hanging drop rods at a busway joint.

After the busway is secured in the hangers, adjust the hangers on the rods for correct elevation.

Sway braces may be required to keep the run straight or to prevent rotation (furnished by the installer).

Wall or Column Support: Single rod hangers (Figure 4 & 5) may be used for mounting busway on walls or columns by the addition of an angle support by the installer.

TABLE 1. PLUG SIZES (INCHES)

Device	Plug Dimensions					Plug Overhangs Busway Each Side
	A	B	C	D	E	
Circuit Breakers						
E-Line		6 ³ / ₄	8 ⁵ / ₈		23 ⁵ / ₈	2 ⁵ / ₈
TB1	16 ⁷ / ₈			9 ³ / ₄		
FJ-FK		7 ³ / ₄	9 ⁵ / ₈		24 ⁵ / ₈	
JJJK	23					5 ¹ / ₂
TB4	29					
KM	35					
TB6-TB8	43 ³ / ₄	10 ³ / ₄	12 ⁵ / ₈	15 ¹ / ₂	26 ⁷ / ₈	
Fusible Switches						
30A, 60A	11 ¹ / ₄	6 ³ / ₄	8 ⁵ / ₈	9 ³ / ₄	18	2 ⁵ / ₈
100A					23 ⁵ / ₈	
200A	16 ⁷ / ₈	7 ¹ / ₄		15 ¹ / ₂	32 ³ / ₈	5 ¹ / ₂
400A						7
600A	23	17 ³ / ₈	19 ¹ / ₂	18 ¹ / ₂	36 ³ / ₄	

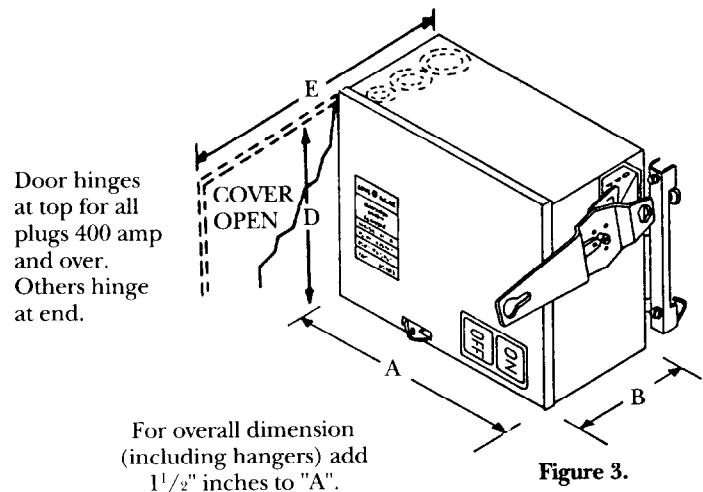


Figure 3.

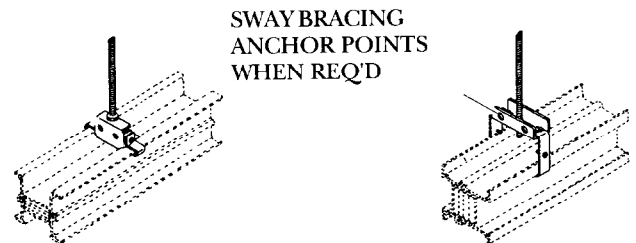


Figure 4. One Stack (Standard) Flatwise

Figure 5. One Stack Edgewise

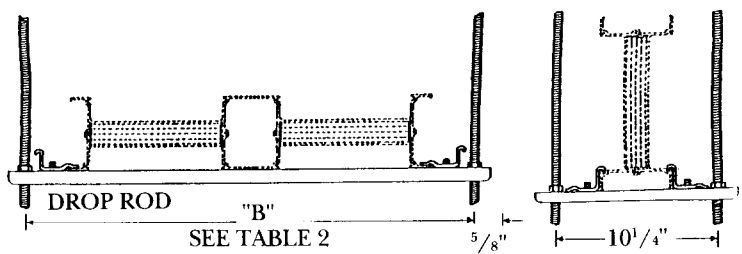


Figure 6.

Figure 7.

VERTICAL MOUNTING

Support busway on maximum 16' centers. Use Table 3 to determine the number of springs required based on busway weight, as shown in Tables 4 and 5.

To assemble hangers to busway (Figure 6, 8 & 9) after placing the length in position thru the floor:

1. Loosen hanger bolts (A).
2. Assemble hanger to each side of busway.
3. Position the hangers on the busway so that the base channel (B) rests on the floor or other support. Floor flange (C) may be placed under hanger, but will not support busway weight.
4. Hand tighten hanger bolts (A).
5. Anchor base channels (B) to their support.
6. Tighten hanger bolts (A).

Install the next length and make the joint assembly (see instructions on next page).

7. Check to ensure hanger has 8" initial floor clearance.

Adjustment of springs (if furnished, Figure 9):

8. Determine required "H" dimension of hanger springs, found on layout drawing or using formula below. Using final adjusting nut(s) (E), set springs on hangers to "H" dimension. After spring is adjusted, tighten jam nut (F) so spring will not move.

"H" Dimension Formula

$$"H" = 5\frac{5}{8} - \frac{W}{150}; W = \frac{\text{Busway wt/ft} \times \text{ft/floor} + \text{devices on floor}}{\text{Total no. of springs/floor}}$$

9. Loosen hanger bolts (A).
10. Position hanger against busway and rest hanger base channels (B) on their supports (installer furnished).
11. Fit hanger clamps (G) to busway housing and hand tighten hanger bolt (A).
12. Anchor base channel (B) to its support.
13. Tighten hanger bolts (A).
14. After busway run is installed, starting at the top hanger, raise the initial adjusting nuts (D) of all hangers to the top of the spring studs. The studs are crimped to hold the nut in the uppermost position.

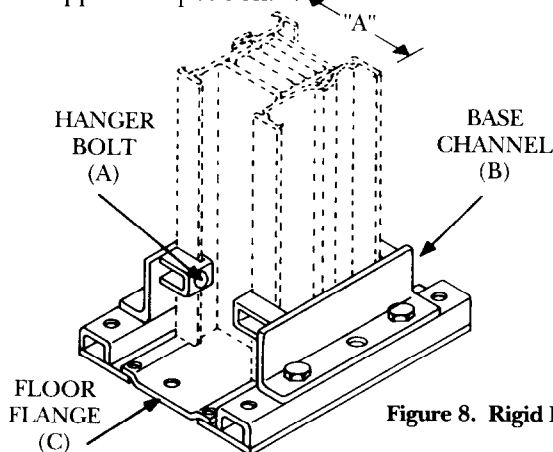


Figure 8. Rigid Riser Hanger

TABLE 2. HANGER DIMENSIONS (INCHES)

Bars per Phase	Ampere Rating		Busway "A"	Hanger "B"
	Copper	Alum.		
1	225-800	225-600	4 ³ / ₈	10 ¹ / ₄ "
	1000	—	5	
	1200	800	5 ⁵ / ₈	
	1350	1000	6 ¹ / ₄	
	1600	1200	7	14
	2000	1350	8 ¹ / ₂	
	—	1600	9 ³ / ₄	
2	2500	2000	11	26
	3000	—	15	
	—	2500	15 ¹ / ₂	
	4000	3000	18	
	5000	4000	23	

TABLE 3. BUSWAY SPRINGS

Busway Height (Lbs.)	No. Springs Req'd
0-600	1
601-1200	2
Over 1200	3

TABLE 4. WEIGHT (LBS.) QMR FUSIBLE SWITCHES

Ampere	Weight
30	24
60	25
100	28
200	46
400	135
600	160

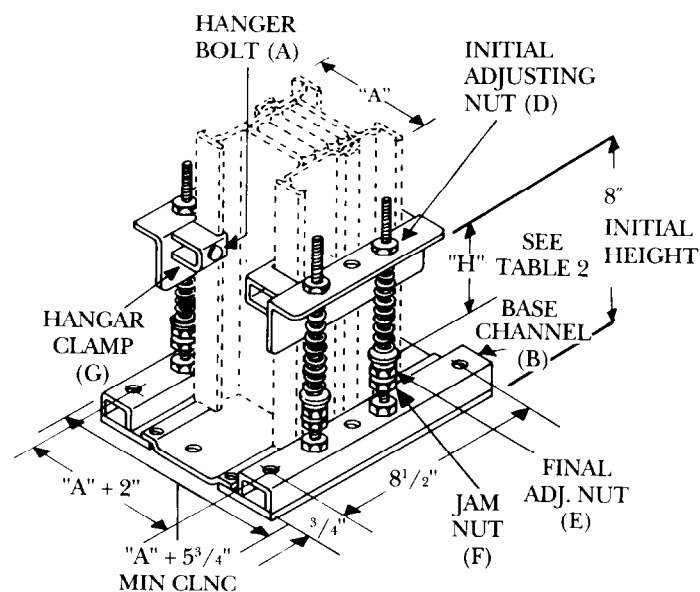


Figure 9. Spring Riser Hanger

Installing Spectra Series™ Busway (cont.)

VERTICAL MOUNTING (CONT.)

TABLE 5. WEIGHT (LBS./FT.) BUSWAY

Ampere	Copper		Aluminum	
	3-wire	4-wire	3-wire	4-wire
225	8	9	5	6
400	8	9	5	6
600	8	9	5	6
800	8	9	6	7
1000	10	12	7	8
1200	12	15	8	9
1350	14	17	9	10
1600	16	20	10	12
2000	21	26	12	15
2500	29	37	17	20
3000	32	40	19	23
4000	42	52	25	30
5000	58	74		

JOINING LENGTHS

1. Remove at least one joint cap from the two pieces to be joined, retaining the bolts.
2. Align sections to be joined by matching up "ø side" labels attached at ends of each section.
3. If necessary, loosen joint bolt slightly.
4. Slide sections together. Make sure that the busbars interweave the insulators as shown in Figures 10-12.
NOTE: the housing ground side plates must pass between the outside insulators and the joint sides.
5. The standard distance between the housings is $8\frac{3}{8}$ " as shown in Figure 10. However, the joint is also adjustable as shown in Figures 11-12. Simply move the sections in or out to the desired length as shown and remove the twist-outs in both joint caps. See Figure 13.
Note: Remove shipping screw to center joint when adjusting to max. length.
6. If not already in place, assemble joint caps and insert all mounting screws LOOSELY.
7. Inspect busway run for straightness in all planes, and make adjustments, if necessary, for good alignment.
8. Lubrication grease has been applied to the joint bolt head and thread to reduce friction. Do not remove this grease.
9. Tighten the joint bolt to 50 foot-pounds. When the belleville springs on both sides are flattened, the bolt is fully torqued. The bolt head may be relocated to the opposite side of the busway if it is inaccessible.
10. Tighten all joint cap screws.
11. During installation occasional meggering should reveal any improperly made assemblies. Resistance should not drop below one megohm for 100 feet of busway.

Megger the complete run before energizing.

JOINTS WITH $\pm 1/2$ " INCH ADJUSTABILITY

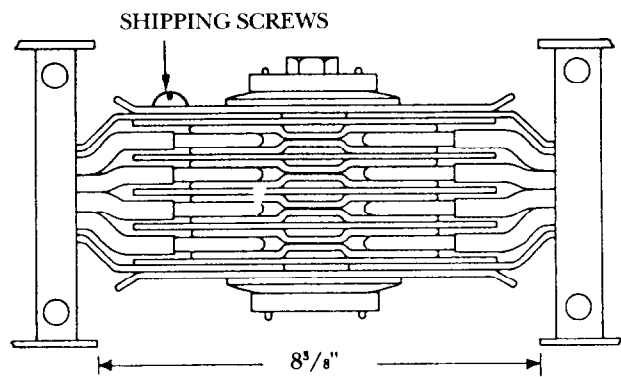


Figure 10. "Standard"

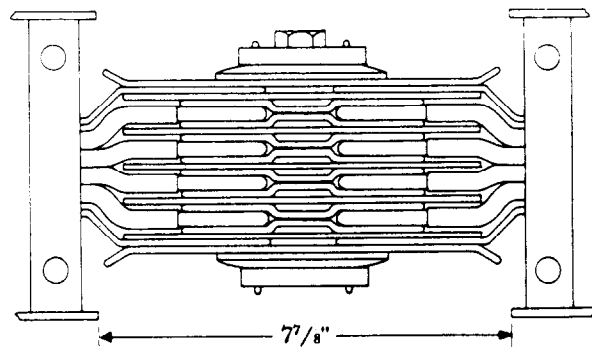


Figure 11. "Minimum"

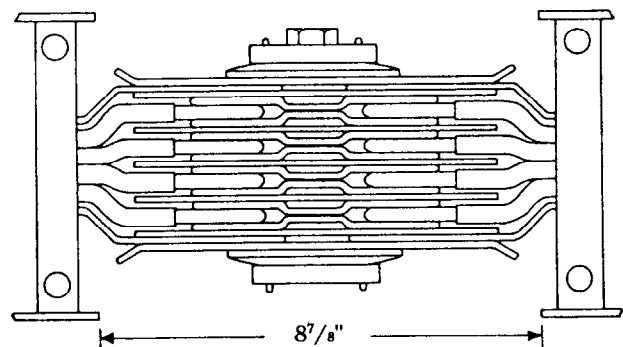


Figure 12. "Maximum"

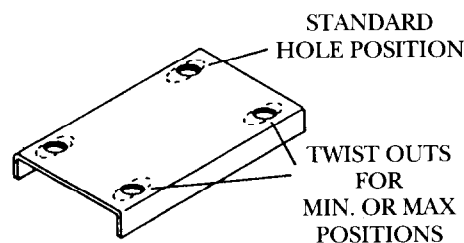


Figure 13. Joint Cap

Installing and Removing Spectra Series™ Busway Plugs

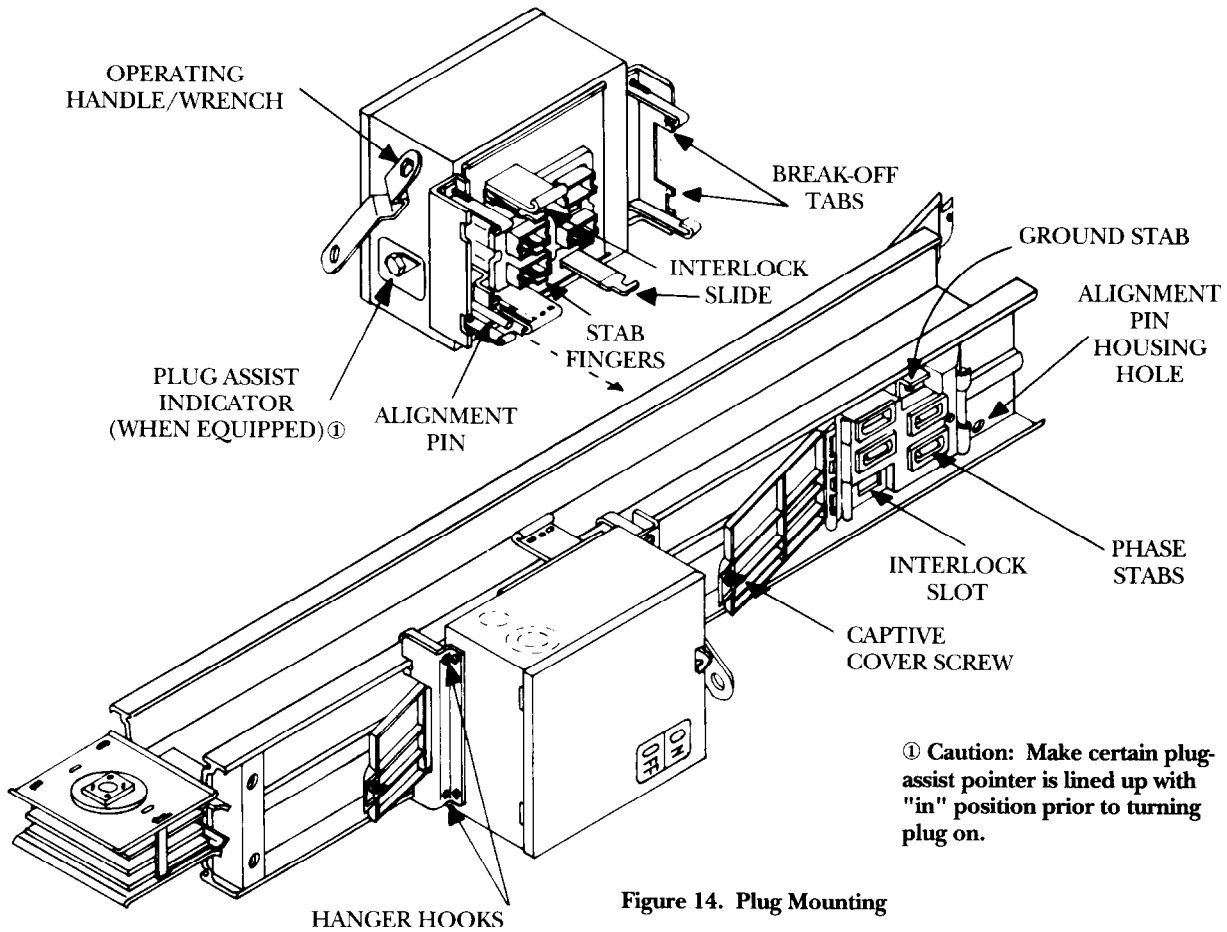


Figure 14. Plug Mounting

It is a good safety practice to de-energize the busway before inserting or removing plugs.

Inspect plug before installing on busway.

Stab fingers have been lubricated with grease which should not be removed.

Busway plug-in outlets are made accessible by hinging the outlet cover 180° to a retaining friction latch.

An alignment pin polarizes and locates the plug in the correct position only.

Plugs are interlocked permitting engagement and disengagement with the busway when in the **OFF** position only.

Place the operating handle at the desired position on the plug and secure it with the screw provided.

If plug-assist has been furnished on the plug, the operating handle may be used as a wrench to operate the mechanism.

To install a plug where the rear plug hanger interferes with a joint cap, it is necessary to remove the "break-off tabs", see Figure 14.

On large plugs, drop rod brackets are provided for auxiliary support of the plug on horizontal rung.

To Install Plug Not Equipped with Plug-Assist: (Figure 14)

1. Make sure device is in **OFF** position.
2. Loosen the four bolts on the hanger hooks.
3. Insert alignment pin into housing hole.
4. Push stabs into full contact with the busway.
5. Engage the four hanger hooks with the busway rails and tighten bolts.

To Install Plug Equipped with Plug-Assist: (Figure 14)

1. Make sure device is in **OFF** position and plug-assist indicator is rotated fully toward stabs-**out** position.
2. Loosen the four bolts on the hanger hooks.
3. Insert alignment pin into housing hole.
4. Engage the four hanger hooks with the busway rails. Tighten bolts and wire device.
5. Rotate plug-assist indicator fully toward the stabs-**in** position.

To remove plugs first turn device **OFF**. Then reverse the actions in the appropriate procedure above.

Installing Spectra Series™ Outdoor Feeder Busway

Install the busway using the instructions for indoor busway with the following exceptions for outdoor busway joints:

Joint Cap: Joint Caps are packaged in the hardware package. Remove the four shipping joint gasket protectors (painted yellow) and retain the joint cap mounting $\frac{1}{2}$ -13 x $\frac{1}{2}$ bolts. Install the joint caps and tighten completely. Some pressure may be required to deflect gasket in order to start screws.

Note that for busway mounted edgewise, the bottom joint cap will be marked "**BOTTOM CAP.**" This cap will have weep holes.

Joint Covers: These covers span the joint on the wide side of the busway. Attach the covers span the joint on the wide side of the busway. Attach the covers with the $\frac{1}{4}$ -20 x $\frac{3}{4}$ screws. Pierce the gasket with a sharp tool such as an awl.

Note that for busway mounted flat, the bottom cover will be marked "**BOTTOM COVER.**" This cover will have weep holes in the dimple(s).

Water Barriers: These are "Z" shaped brackets that are factory assembled with the same bolts that hold the joint bars to the busway. For vertical riser installations, the water barriers on the bottom side will have weep holes factory installed.

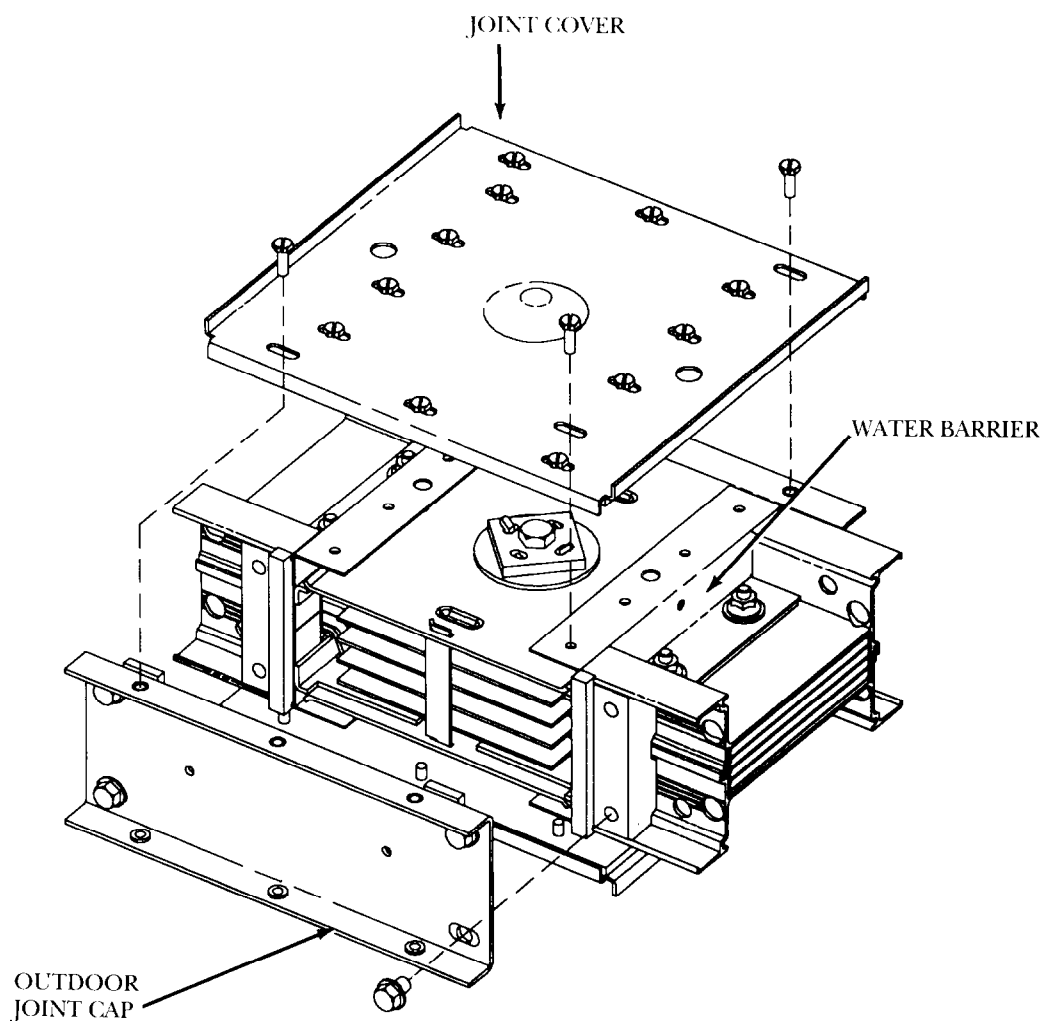


Figure 15.

Installing Spectra Series™ Indoor Drip Proof Busway

The following material is included in three hardware packages supplied for indoor drip proof busway:

Joint caps	Nut angles
Joint covers & hardware	Caulking

Install the busway using the instructions for indoor busway with the following exceptions for indoor drip proof busway:

Joint Cap: Remove the four shipping joint gasket protectors (painted yellow) and retain the joint cap mounting $\frac{3}{8}$ -16 x $\frac{1}{2}$ bolts. Install the joint caps and tighten completely. Pierce the gasket with a sharp tool such as an awl. Some pressure may be required to deflect gasket in order to start screws. Note that for busway mounted edgewise, the bottom cap will be marked "**BOTTOM CAP**". This cap will have weep holes.

Joint Cover(s): The covers span the joint on the wide side of the busway. Attach the cover(s) with the $\frac{1}{4}$ x 20 x $\frac{3}{4}$ screws. Pierce the gasket with a sharp tool such as an awl.

Note that for busway mounted flat, there is only a cover on the top side. For vertical risers, there is a cover on both sides.

The nuts for the joint cover(s) are angle brackets that interlock with the busway housing and have tapped holes to receive the $\frac{1}{4}$ -20 screws.

Caulk along the legs of the joint caps and the busway housing between the joint covers and the corner of the joint cap.

Water Barriers: These are "Z" shaped brackets that are factory assembled with the same bolts that hold the joint sides to the busway. For vertical riser installations, the water barriers on the bottom side will have weep holes factory installed.

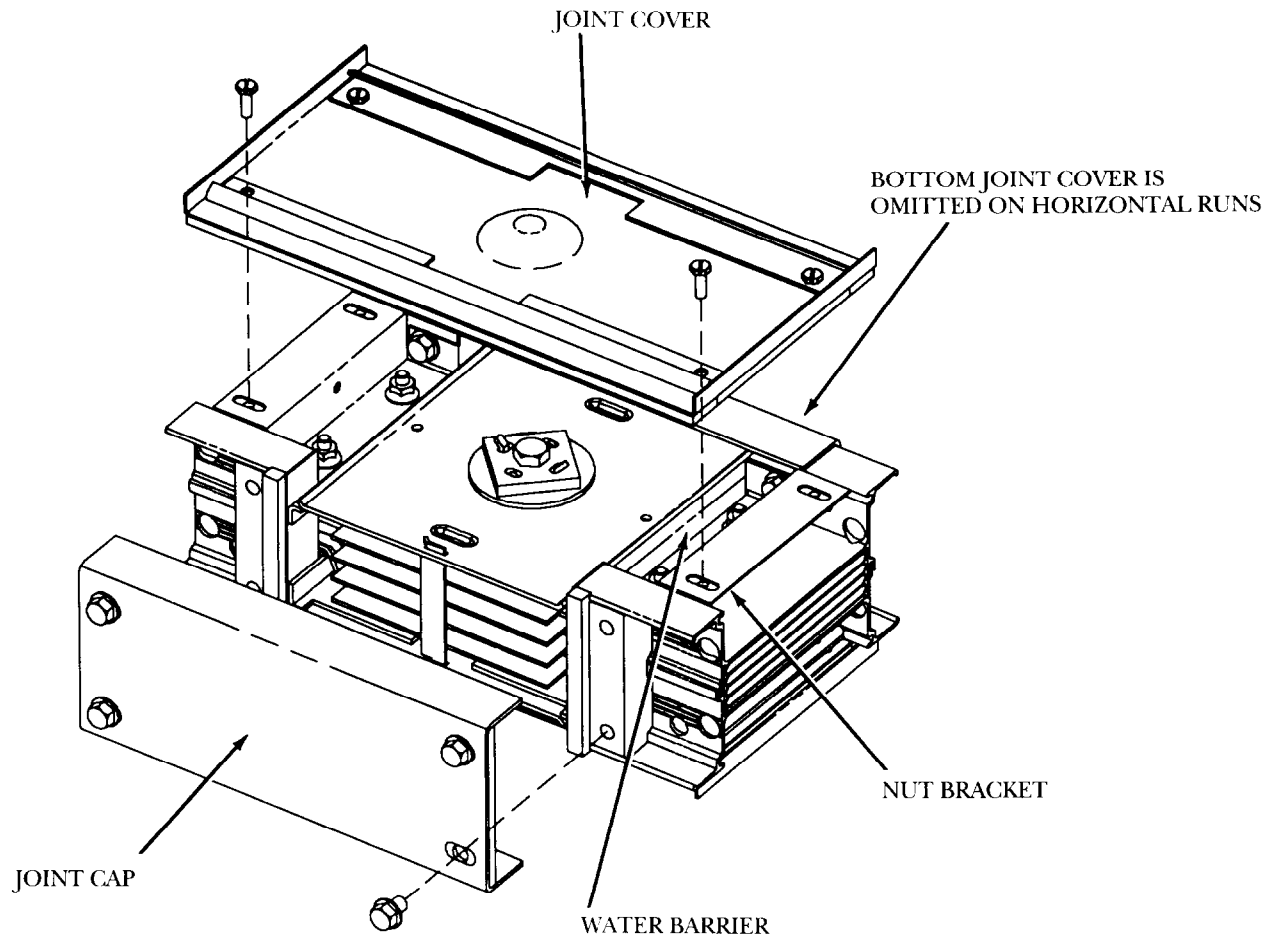


Figure 16.

Busway Maintenance Procedures

PROTECTING THE BUSWAY

Particular care must be exercised during installation to protect the busway from contaminants.

Should the busway inadvertently become contaminated with water, it should be baked dry or replaced. Contact the company for instructions.

INSPECTING THE BUSWAY

Periodic inspections should be made to spot trouble areas or changes in operating condition.

Accumulations of dust, dirt or foreign matter should be removed.

Moisture from leaks or condensation dripping from pipes should be eliminated.

Check for any equipments installed near the busway that may cause damage because of undue external heating.

Visually inspect the belleville springs at the joint to ensure that the springs are flat. Flat springs indicate that proper joint pressure is being maintained. It is not necessary to re-check torque on joint bolt as long as visual check is satisfactory.

WARNING: *De-energize the busway before performing any of the following operations.*

Carefully inspect all visible electrical joints and terminations for tightness of bolts, nuts, etc.

Check for signs of overheating at joints, terminations, fuse clips, etc., or deterioration in insulating material or melting of sealing compound.

Be sure the condition which caused any overheating has been eliminated.

Check for missing or broken parts, proper spring tension, free movement, rusting or corrosion, dirt, excessive wear, arc spatter, sooty deposits, tracking. Clean or replace parts as required.

Megger the system before re-energizing. The resistance should not be below one megohm for 100 feet of busway.

For general instructions regarding handling, installation, operation, and maintenance of busway systems rated 600 volts or less, see NEMA Publication BUI.1.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the GE Company.



GE Electrical Distribution & Control

General Electric Company
41 Woodford Ave., Plainville, CT 06062